Claims.

1. Improvements to compressors which are at least provided with a compressor element with a gas inlet and a gas outlet, a sensor to determine the outlet temperature (TO) in the gas outlet, a sensor to determine the rotational speed (S) of the compressor element, a motor with adjustable speed, and a control device (12) for this motor, characterised in that the compressor is provided with a dynamic speed limiter which comprises what is called a hysteresis module (13), coupled to the above-mentioned control device (12) and to the above-mentioned sensors for the outlet temperature (TO) and the rotational speed (S), whereby a hysteresis upper temperature limit (HMAX) has been defined in this hysteresis module, as well as an admitted maximum speed range which is determined by a minimum rotational speed (SMIN) and a maximum rotational speed (SMAX) and whereby, as soon as the measured outlet temperature (TO) reaches the specified hysteresis upper temperature limit (HMAX), the actual rotational speed of the compressor element is either lowered with a speed jump (DS) when the measured rotational speed is situated in the high speed range close to the maximum rotational speed (SMAX), or is increased with a speed jump (DS) when the measured rotational speed is situated in the low speed range close to the minimum rotational speed (SMIN).

2. Improvements to compressors according to claim 1, characterised in that the hysteresis upper temperature

limit (HMAX) is somewhat lower than the maximum admitted critical threshold value (TMAX) of the outlet temperature (TO) above which the compressor will be damaged, in particular is less than 20°C lower than said critical threshold value (TMAX).

3. Improvements to compressors according to claim 1 or 2, characterised in that a hysteresis lower temperature limit (HMIN) has been defined in the hysteresis module (13), whereby, as soon as the measured outlet temperature (TO) reaches the specified hysteresis lower temperature limit (HMIN), the actual rotational speed of the compressor element is either raised when the measured rotational speed is situated in the highest speed range close to the critical maximum rotational speed (SMAX), or is lowered when the measured rotational speed is situated in the lowest speed range close to the critical minimum rotational speed (SMIN).

4. Improvements to compressors according to claim 3, characterised in that the hysteresis module (13) is configured such that, as soon as the measured outlet temperature (TO) reaches the hysteresis lower temperature limit (HMIN), the entire aforesaid admitted maximum speed range (SMAX-SMIN) becomes available again.

5. Improvements to compressors according to claim 1, characterised in that the speed jump (DS) can be adjusted when the hysteresis upper temperature limit (HMAX) is reached.

6. Improvements to compressors according to any of claims 3 to 5, characterised in that the above-mentioned speed jump (DS) can be adjusted such that a resulting decrease of the outlet temperature (TO) is always smaller than the difference between the hysteresis upper temperature limit (HMAX) and the hysteresis lower temperature limit (HMIN) in order to avoid cyclic instable behaviour of the rotational speed of the compressor.

7. Improvements to compressors according to claim 1, characterised in that the hysteresis module is configured such that the outlet temperature (TO) is measured with a certain periodicity, namely at least once per minute, and preferably continuously.

8. Improvements to compressors according to claim 7, characterised in that the hysteresis module is configured such that the periodicity of the measurements of the outlet temperature (TO) is increased as soon as the outlet temperature (TO) exceeds the hysteresis upper temperature limit.

9. Improvements to compressors according to claim 3, characterised in that an increase of the rotational speed resulting from the hysteresis upper temperature limit (HMAX) being reached in the lower speed range of the compressor results in an increase of the operational pressure which will lead to an automatic idle condition and possibly to an automatic stop/restart mode of the compressor, without switching to an unwanted stop mode with alarm and manual re-start.

10. Improvements to compressors according to any of the preceding claims, characterised in that the above-mentioned control device for the motor is provided with at least one safety device in order to prevent extreme conditions (SMAX).

11. Improvements to compressors according to any of the preceding claims, characterised in that the dynamic speed limiter is programmed in order to obtain an almost optimal operation of the compressor with a speed range larger than 2.5, preferably between 2.7 and 3.5.

12. Improvements to compressors according to any of the preceding claims, characterised in that the dynamic speed limiter can be adjusted such that at least the admitted maximum temperature can be set, preferably between 150°C and 350°C, better still between 200°C and 300°C.

13. Method for compressing gas by means of a compressor showing improvements according to any of the preceding claims.

14. Dynamic speed limiter or hysteresis module (13) belonging to it as described in any of claims 1 to 12 included.

15. Dynamic speed limiter which is suitable for a dynamic regulation of a compressor according to any of claims 1 to 12 included, whereby the speed limiter comprises a hysteresis module 13 with a memory for possible outlet

temperature curves representing the outlet temperature TO as a function of the rotational speed (S) and whereby a hysteresis upper and lower temperature limit (HMIN and HMAX) have been set in the hysteresis module (13), as well as a speed jump (DS) for the rotational speed (S), either or not adjustable, when the above-mentioned upper and/or lower temperature limit (HMIN, HMAX) is reached.

16. Dynamic speed limiter according to claim 15, characterised in that it comprises a memory to determine whether the rotational speed (5) of the compressor is situated in the lower speed range (SMIN - K), or in the higher speed range (L - SMAX) in order to thus realise the correct speed adjustment, a speed increase or a speed drop respectively, when the upper temperature limit (HMAX) is reached.

17. Dynamic speed limiter according to claim 15 or 16, characterised in that it comprises a memory (15) to carry out an automatic re-start at the same speed as when the compressor was running idle before.